

DETAILED ACTION

Receipt is acknowledged of amendment filed on December 19, 2007. Claim rejections made under 35 U.S.C. §§ 112 and 102(b) are withdrawn in view of the claim amendment made by applicants.

Authorization for this examiner's amendment was given in a telephone interview with Choongseop Lee on March 21, 2008, however, the indicated allowability of claims as discussed during the interview is withdrawn in view of the newly discovered reference(s) to Batarsch (US 6630172 B2).

Claim Objections

Claims 2 and 9 are objected to because of the following informalities:

In claims 2 and 9, the term "amphoteric" is misspelled.

In claims 2 and 9, "adjuvants one or more" should be "one or more adjuvants".

In claims 2 and 9, "a surfactant for dispersion one or more" should be "one or more surfactants for dispersion".

In claim 2, lines 5 and 9, there should be a conjunction "and" in the Markush group. See also claim 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the titanium dioxide colloids" in claim 2. There is insufficient antecedent basis for this limitation in the claim since the base claim does not mention any colloidal form of composition.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 2, 4, 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aubay et al. (US 6905814).

Aubay discloses a composition comprising a film-forming titanium dioxide nanoparticle dispersion for cleaning and disinfecting surfaces along with PH regulating acids, alkali metal hydroxides, and surfactants. See col. 2, line 36-col. 3, line 23. The prior art is used to cleanse and disinfect the surface of plants. See col. 1, lines 39 – 46.

The reference fails to teach silver nanoparticles.

Batarsch teaches microbicidal composition comprising potassium sodium tartrate and a metal ion complex for fresh or cut flowers and plants. See abstract. The reference teaches using microbicidal metal ions such as colloidal silver and titanium, copper, zinc, manganese, etc. See col. 3, line 13 - col. 4, line 55. The reference also teaches that the formulations can be used as "an agent to control pets, insects, and/or microorganisms and thus preserves a living plant and protects the plant from plant

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diseases, bacteria, virus, fungus, algae, insects, and the like". See col. 6, lines 1 - 17. Diluting the composition for the use on plant of flowers is also mentioned. See col. 6, lines 14 - 17. The reference also reports that colloidal silver is a pure, all-natural substance consisting of sub-microscopic clusters of silver ions held in aqueous suspension having a powerful prophylactic antibiotic which was used for years with no known side effects. See col. 2, lines 19 -31.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to modify the teachings of Aubay by incorporating silver nanoparticles as motivated Batarsch because both references teach disinfection aqueous suspensions comprising metal particles and Batarsch teaches that colloidal silver has long been used as antibiotic for plants. The skilled artisan would have had a reasonable expectation of successfully producing an aqueous dispersion comprising titanium dioxide nanoparticles and colloidal silver with enhanced disinfecting properties for plants.

With respect to claims 8, 10-12, the terms "necessary for plant growth", "for greater effect on crop yield" and "for absorbing to plant" denote the intended use or purpose of the claimed compositions, and do not afford any patentable weight. See MPEP § 2111.02.

Response to Arguments

Applicant's arguments with respect to claims 2, 4, 7-11 have been considered but are moot in view of the new ground(s) of rejection in part and unpersuasive in part.

Applicant asserts that the purpose of the Aubay invention is different from the present invention; however, as indicated in the rejection, the use of the Aubay composition to disinfect plant is disclosed in the reference. Furthermore, the present invention is directed to a composition and not a method of using the composition.

Applicant also asserts that the Aubay composition is "completely different" from the present invention due to the particle size, the presence of surfactants and film-forming polymers. It is respectfully noted that the particle size range of the prior art titanium dioxide particles and the present invention overlap since particle size of 3-200 nm include the size "less than 100 nm". The prior art also uses surfactants to make a dispersion, as discussed above in the rejection, and the present invention does not exclude the presence of the polymer. See MPEP § 2111.03.

Applicant asserts that the disinfection effect of the Aubay invention is "achieved by adhering titanium dioxide film forming dispersion to the surface of an object and by exposing in the surface to sunlight". Examiner respectfully disagrees, because both prior art and the present invention use same titanium dioxide nanoparticles in aqueous dispersion on plants and it is obvious that the titanium dioxide particles will similarly effect the targeted plant.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GINA C. YU whose telephone number is (571)272-8605.

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The examiner can normally be reached on Monday through Friday, from 8:00AM until 5:30 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sreeni Padmanabhan can be reached on 571-272-0629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Gina C. Yu/
Primary Examiner, Art Unit 1617